REMARKS

This preliminary amendment is submitted to amended the format of the claims to current U.S. claiming conventions. The Commissioner is hereby authorized to charge any fees or credit any over-payment associated with this communication to Deposit Account No. 50-0902 (75978/10787).

Respectfully Submitted,

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MARKED-UP VERSION OF PENDING CLAIMS

1. (Canceled) A method of separating a blood clotting protein from a mixture of blood clotting protein and at least one contaminant, the method comprising:

(a) placing a blood clotting protein and contaminant mixture in a first solvent stream, the first solvent stream being separated from a second solvent stream by a first electrophoretic membrane;

(b) selecting a buffer for the first solvent stream being a pH greater than the isoelectric point of the blood clotting protein;

(c) applying an electric potential between the first and second solvent streams causing movement of at least some of the contaminants through the membrane into the second solvent stream, or if entering the membrane, being substantially prevented from entering the second solvent stream;

(d) optionally periodically stopping and reversing the electric potential to cause movement of any blood clotting protein having entered the membrane to move back into the first solvent stream, wherein substantially not causing any contaminants that have entered the second solvent stream to re-enter first solvent stream; and

(e) maintaining step (c) until the first solvent stream contains the desired purity of blood clotting protein substantially mimicking the characteristics of natural blood clotting protein.

2. (Canceled) The method according to claim 1 further including the steps of:

(f) replacing the first electrophoretic membrane with a second electrophoretic membrane having a molecular mass cut-off greater that of the first membrane;

(g) applying an electric potential between the first and second solvent streams causing movement of at least some of the contaminants through the second membrane into the second solvent stream while the blood clotting protein is substantially retained in the first solvent stream, or if entering the second membrane, being substantially prevented from entering the second solvent stream;

(h) optionally periodically stopping and reversing the electric potential to cause movement of any blood clotting protein having entered the second membrane to move

back into the first solvent stream, wherein substantially not causing any contaminants htat have entered the second solvent stream to re-enter first solvent stream; and

(i) maintaining step (g) until the first solvent stream contains the desired purity of blood clotting protein substantially mimicking the characteristics of natural blood clotting protein.

3. (Canceled) The method according to claim 1 or 2 wherein the mixture is plasma obtained from human blood and the blood clotting protein is fibrinogen.

4. (Canceled) The method according to any one of claims 1 to 3 wherein the first electrophoretic membrane has a molecular mass cut-off close to the apparent molecular mass of the blood clotting protein, and the second electrophoretic membrane has a molecular mass cut-off greater than the first electrophoretic membrane.

5. (Canceled) The method according to claim 4 wherein the first electrophoretic membrane has a molecular mass cut-off of 300 kDa and the second electrophoretic membrane has a molecular mass cut-off of 1000 kDa.

6. (Canceled) The method according to any one of claims 1 to 5 wherein the solvent streams have a pH of 7.0.

7. (Canceled) The method according to any one of claims 3 to 6 wherein recovery of fibrinogen from blood plasma is at least 70% and the fibrinogen having at least 95% clottability.

8. (Canceled) Isolated fibrinogen substantially mimicking the characteristics of natural fibrinogen purified by the method according to any one of claims 3 to 7.

9. (Canceled) Isolated fibrinogen substantially having the clotting and functional characteristics of native fibrinogen.

10. (Canceled) Use of isolated fibrinogen according to claim 8 or 9 in medical and veterinary applications.

11. (Canceled) The use according to claim 10 selected from the group consisting of fibrin glue, isolating and characterising fibrinogen in dysfibrinogenaemias, inclusion in vascular grafts, and in wound healing aids.

12. (Canceled) A method of separating blood clotting protein from a mixture including blood clotting protein and at least one contaminant, the blood clotting protein and the at least one contaminant each having a respective size and a respective charge, the method comprising the steps of:

exposing the mixture to an electric field in the presence of an electrophoretic membrane having a defined pore size to thereby separate at least a portion of the blood clotting protein and the at least one contaminant onto opposite sides of the membrane in accordance with differences in at least one of the size and charge between the blood clotting protein and the at least one contaminant;

maintaining the exposing step for a period not greater than 48 hours; and

recovering from the mixture not less than 40% of the blood clotting protein content of the mixture.

13. (Canceled) A method of separating a blood clotting protein from a mixture including blood clotting protein and at least one contaminant, the blood clotting protein and the at least one contaminant each having a respective size and a respective charge, the method comprising the steps of:

exposing the mixture to an electric field in the presence of an electrophoretic membrane having a defined pore size to thereby separate at least a portion of the blood clotting protein and the at least one contaminant onto opposite sides of the membrane in accordance with differences in at least one of the size and charge between the blood clotting protein and the at least one contaminant;

maintaining the exposing step for a period not greater than 48 hours; and

recovering from the mixture a blood clotting protein, wherein in a clotting test the blood clotting protein produces fibrins in a clot having a mass to length ration similar to that obtained with plasma in the same clotting test.

14. (Canceled) A method of separating blood clotting protein from a mixture including blood clotting protein and at least one contaminant, the blood clotting protein and the at least one contaminant each having a respective size and a respective charge, the method comprising the steps of:

exposing the mixture to an electric field in the presence of an electrophoretic membrane having a defined pore size to thereby separate at least a portion of the blood clotting protein and the at least one contaminant onto opposite sides of the membrane in accordance with differences in at least one of the size and charge between the blood clotting protein and the at least one contaminant;

maintaining the exposing step for a period not greater than 48 hours; and

recovering from the mixture a blood clotting protein, wherein in a clotting test the blood clotting protein produces a clot having fibrin network compaction similar to that obtained with plasma in the same clotting test.

15. (Canceled) A method of separating blood clotting protein from a mixture including blood clotting protein and at least one contaminant, the blood clotting protein and the at least one contaminant each having a respective size and a respective charge, the method comprising the steps of:

exposing the mixture to an electric field in the presence of an electrophoretic membrane having a defined pore size to thereby separate at least a portion of the blood clotting protein and the at least one contaminant onto opposite sides of the membrane in accordance with differences in at least one of the size and charge between the blood clotting protein and the at least one contaminant;

maintaining the exposing step for a period not greater than 48 hours; and

recovering from the mixture a blood clotting protein having a purity of not less that 90%.

16. (New) A method for isolating at least one blood clotting protein from a mixture containing the at least one blood clotting protein and at least one contaminant, the method comprising:

(a) directing a first fluid stream having a selected pH and including the mixture containing at least one blood clotting protein and the at least one contaminant, so as to flow along a first selective membrane, wherein such pH is selected such that the pH is greater than the isoelectric point of the at least one blood clotting protein;

(b) directing a second fluid stream along the first selective membrane so as to be isolated from the first fluid stream thereby;

(c) applying at least one selected electric potential across at least the first and second fluid streams, wherein the application of the at least one selected electric potential causes migration of at least a portion of a selected one of the at least one blood clotting protein and the at least one contaminant through the first selective membrane while at least a portion of the other of the at least one blood clotting protein and the at least one contaminant is prevented from entering the second fluid stream; and

(d) maintaining step (c) until at least one of the fluid streams contains the desired purity of the at least one blood clotting protein.

17. (New) The method according to claim 16 wherein the at least one isolated blood clotting protein substantially mimics the characteristics of natural blood clotting proteins.

18. (New) The method according to claim 16 wherein the mixture is comprised of plasma obtained from human blood and the at least one blood clotting protein is fibrinogen.

19. (New) The method according to claim 16 wherein the first selective membrane has a molecular mass cut-off close to the apparent molecular mass of the blood clotting protein.

20. (New) The method according to claim 16 wherein the pH of the first fluid stream is about 7.0.

21. (New) The method according to claim 16 wherein the method further comprises at least one of periodically stopping the at least one electric potential and reversing the at least one selected electric potential to cause movement of at least any components in the first fluid stream having entered the first selective membrane to move back into the first fluid stream and wherein substantially not causing any components which have entered the second fluid stream to re-enter the first fluid stream.

22. (New) The method according to claim 16 wherein the yield of the at least one blood clotting protein is at least about 70%.

23. (New) The method according to claim 18 wherein the fibrinogen has at least about 95% clottability.

24. (New) The method according to claim 16 wherein the method further comprises

(e) recovering the at least one blood clotting protein isolated from the mixture from at least one of the first and second fluid streams;

(f) providing the at least one blood clotting protein into a third fluid stream and directing the third fluid stream so as to flow along a second selective membrane, wherein the third fluid stream is selected from the group consisting of the first fluid stream and a fluid stream different from the first fluid stream;

(g) directing a fourth fluid stream along the second selective membrane so as to be isolated from the third fluid stream thereby, wherein the fourth fluid stream is selected from the group consisting of the second fluid stream and a fluid stream different from the second fluid stream;

(h) applying at least one selected electric potential across at least the third and fourth fluid streams, wherein the application of the at least one selected electric potential causes migration of at least a portion of a selected one of the at least one blood clotting protein and other components in the third fluid stream through the second selective membrane while at least a portion of the other of the at least one blood clotting protein and other components in the third fluid stream is prevented from entering the fourth fluid stream; and

(i) maintaining step (h) until at least one of the fluid streams contains the desired purity of the at least one blood clotting protein.

25. (New) The method according to claim 24 wherein the at least one isolated blood clotting protein substantially mimics the characteristics of natural blood clotting proteins.

26. (New) The method according to claim 24 wherein the mixture is comprised of plasma obtained from human blood and the at least one blood clotting protein is fibrinogen.

27. (New) The method according to claim 24 wherein the second selective membrane has a larger molecular mass cut-off than the first selective membrane.

28. (New) The method according to claim 24 wherein the pH of the third fluid stream is about 7.0.

29. (New) The method according to claim 24 wherein the yield of the at least one blood clotting protein is at least about 70%.

30. (New) The method according to claim 26 wherein the fibrinogen has at least about 95% clottability.

31. (New) The method according to claim 24 wherein the method further comprises at least one of periodically stopping the at least one electric potential and reversing the at least one selected electric potential to cause movement of at least any components in the third fluid stream having entered the second selective membrane to move back into the third fluid stream and wherein substantially not causing any components which have entered the fourth fluid stream to re-enter the third fluid stream.

32. (New) A method for isolating at least one blood clotting protein from a mixture containing the at least one blood clotting protein and at least one contaminant, the method comprising:

(a) communicating a first fluid volume along a first selective membrane having a characteristic pore size, wherein the first fluid volume includes the mixture containing at least one blood clotting protein and the at least one contaminant, wherein the at least one blood clotting protein and at least one contaminant each have a characteristic size and charge;

(b) communicating a second fluid volume along the first selective membrane so as to be isolated from the first fluid volume thereby;

(c) applying at least one selected electric potential across at least the first and second fluid volumes, wherein the application of the at least one selected electric potential and the characteristic pore size of the first selective membrane causes migration of at least a portion of a selected one of the at least one blood clotting protein and the at least one contaminant through the first selective membrane while at least a portion of the other of the at least one blood clotting protein and the at least one contaminant is prevented from entering the second fluid volume;

(d) maintaining step (c) for a predetermined period; and

(e) recovering from at least one of the fluid volumes a blood clotting protein.

33. (New) The method according to claim 32 wherein at least about 40% of the blood clotting protein is recovered from the mixture.

34. (New) The method according to claim 32 wherein in a clotting test the blood clotting protein recovered produces fibrins in a clot having a mass to length ration similar to that obtained with plasma in a similar clotting test.

35. (New) The method according to claim 32 wherein in a clotting test the blood clotting protein recovered produces a clot having a fibrin network compaction similar to that obtained with plasma is a similar clotting test.

36. (New) The method according to claim 32 wherein the blood clotting protein recovered has a purity of at least about 90%.

37. (New) The method according to claim 32 wherein the mixture is comprised of plasma obtained from human blood and the at least one blood clotting protein is fibrinogen.

38. (New) The method according to claim 32 wherein the method further comprises at least one of periodically stopping the at least one electric potential and reversing the at least one selected electric potential to cause movement of at least any components in the first fluid volume having entered the first selective membrane to move back into the first fluid volume and wherein substantially not causing any components which have entered the second fluid volume to re-enter the first fluid volume.

39. (New) A system for isolating at least one blood clotting protein from a mixture containing the at least one blood clotting protein and at least one contaminant, the system comprising:

means adapted for directing a first fluid stream having a selected pH and including the mixture containing at least one blood clotting protein and the at least one contaminant, so as to flow along a first selective membrane, wherein such pH is selected such that the pH is greater than the isoelectric point of the at least one blood clotting protein;

means adapted for directing a second fluid stream along the first selective membrane so as to be isolated from the first fluid stream thereby; and

means adapted for applying at least one selected electric potential across at least the first and second fluid streams, wherein the application of the at least one selected electric potential causes migration of at least a portion of a selected one of the at least one blood clotting protein and the at least one contaminant through the first selective membrane while at least a portion of the other of the at least one blood clotting protein and the at least one contaminant is prevented from entering the second fluid stream.

40. (New) The system according to claim 39 wherein the at least one isolated blood clotting protein substantially mimics the characteristics of natural blood clotting proteins.

41. (New) The system according to claim 39 wherein the system further comprises:

means adapted for recovering the at least one blood clotting protein isolated from the mixture from at least one of the first and second fluid streams;

means adapted for providing the at least one blood clotting protein into a third fluid stream and directing the third fluid stream so as to flow along a second selective membrane, wherein the third fluid stream is selected from the group consisting of the first fluid stream and a fluid stream different from the first fluid stream;

means adapted for directing a fourth fluid stream along the second selective membrane so as to be isolated from the third fluid stream thereby, wherein the fourth fluid stream is selected from the group consisting of the second fluid stream and a fluid stream different from the second fluid stream; and

means adapted for applying at least one selected electric potential across at least the third and fourth fluid streams, wherein the application of the at least one selected electric potential causes migration of at least a portion of a selected one of the at least one blood clotting protein and other components in the third fluid stream through the second selective membrane while at least a portion of the other of the at least one blood clotting protein and other components in the third fluid stream is prevented from entering the fourth fluid stream.

42. (New) The system according to claim 39 wherein the at least one isolated blood clotting protein substantially mimics the characteristics of natural blood clotting proteins.

43. (New) A system for isolating at least one blood clotting protein from a mixture containing the at least one blood clotting protein and at least one contaminant, the system comprising:

means adapted for communicating a first fluid volume along a first selective membrane having a characteristic pore size, wherein the first fluid volume includes the mixture containing at least one blood clotting protein and the at least one contaminant, wherein the at least one blood clotting protein and at least one contaminant each have a characteristic size and charge;

means adapted for communicating a second fluid volume along the first selective membrane so as to be isolated from the first fluid volume thereby;

means adapted for applying at least one selected electric potential across at least the first and second fluid volumes, wherein the application of the at least one selected electric potential and the characteristic pore size of the first selective membrane causes migration of at least a portion of a selected one of the at least one blood clotting protein and the at least one contaminant through the first selective membrane while at least a portion of the other of the at least one blood clotting protein and the at least one contaminant is prevented from entering the second fluid volume; and

means adapted for recovering from at least one of the fluid volumes a blood clotting protein.

44. (New) Isolated fibrinogen substantially mimicking the characteristics of natural fibrinogen purified according to the method of claim 16.

45. (New) Isolated fibrinogen substantially mimicking the characteristics of natural fibrinogen purified according to the method of claim 32.

46. (New) Isolated fibrinogen substantially having the clotting and functional characteristics of native fibrinogen purified according to the method of claim 16.

47. (New) Isolated fibrinogen substantially having the clotting and functional characteristics of native fibrinogen purified according to the method of claim 32.